I. *A new Method for making* Logarithms, *and* vice verſâ, *for finding the Number correſponding to a* Logarithm *given, by help of the following Table. Communicated by Mr.* John Long, S. Theol. Bacc. *and Fellow of* Corpus Chriſti *Coll.* Oxon.

Log.	*Nat. Num.*
0,9	7.943282347
0,8	6.309573445
0,7	5.011872336
0,6	3.981071706
0,5	3.162277660
0,4	2.511886432
0,3	1.995262315
0,2	1.584893193
0,1	1.258925412
0,09	1.230268771
0,08	1.202264435
0,07	1.174897555
0,06	1.148153621
0,05	1.122018454
0,04	1.096478196
0,03	1,071519305
0,02	1.047128548
0,01	1.023292992
0,009	1.020939484
0,008	1.018591388
0,007	1.016248694
0,006	1.013911386
0,005	1.011579454
0,004	1.009252886
0,003	1.006931669
0,002	1.004615794
0,001	1.002305238

Log.	*Nat. Num.*
0,0009	1.002074475
0,0008	1.001843766
0,0007	1.001613109
0,0006	1.001382506
0,0005	1.001151956
0,0004	1.000921459
0,0003	1.000691015
0,0002	1.000460623
0,0001	1.000230285
0,00009	1.000207254
0,00008	1.000184224
0,00007	1.000161194
0,00006	1.000138165
0,00005	1.000115136
0,00004	1.000092106
0,00003	1.000069080
0,00002	1.000046053
0,00001	1.000023026
0,000009	1,000020724
0,000008	1.000018421
0,000007	1.000016118
0,000006	1.000013816
0,000005	1.000011513
0,000004	1.000009210
0,000003	1.000006908
0,000002	1.000004605
0,000001	1.000002302

Log.	*Nat. Num.*
0,0000009	1.000002072
0,0000008	1.000001842
0,0000007	1.000001611
0,0000006	1.000001381
0,0000005	1.000001151
0,0000004	1.000000921
0,0000003	1.000000690
0,0000002	1.000000460
0,0000001	1 000000230

Log.	*Nat. Num.*
0,00000009	1 000000207
0,00000008	1.000000184
0,00000007	1.000000161
0,00000006	1.000000138
0,00000005	1.000000115
0,00000004	1.000000092
0,00000003	1.000000069
0,00000002	1.000000046
0.00000001	1.000000023

This Table is what I ſometimes make uſe of for finding the Logarithm of any Number propos'd, and *vice verſâ*. For inſtance: Suppoſe I had occaſion to find the Logarithm of 2000. I look in the firſt Claſs of my Table (the whole Table conſiſts of 8 Claſſes) for the next leſs to 2, which is 1.995262315, and againſt it is 3, which conſequently is the firſt Figure of the Logarithm ſought. Again; dividing the Number propos'd 2, by 1.995262315 the Number found in the Table, the Quotient is 1.002374467; which being look'd for in the ſecond Claſs of the Table, and finding neither its equal, nor a leſſer, I add 0 to the part of the Logarithm before found, and look for the ſaid Quotient 1.002374467 in the third Claſs, where the next leſs is 1.002305238, and againſt it is 1, to be added to the part of the Logarithm already found; and dividing the Quotient 1.002374467, by 1.002305238, laſt found in the Table, the Quotient is 1.000069070; which being ſought in the fourth Claſs gives 0, but being ſought in the fifth Claſs gives 2, to be added to the part of the Logarithm already found; and dividing the laſt Quotient by the Number laſt found in the Table, *viz.* 1.000046053, the Quotient is 1.000023015, which being ſought in the ſixth Claſs, gives 9 to the part of the Logarithm already found: And dividing the laſt Quotient by the new Diviſor, *viz.* 1.000002072, the Quotient is 1 000000219, which being greater than 1.000000115, ſhews that the Logarithm already found, *viz.* 3.3010299 is leſs than the Truth by more than half an Unit; wherefore adding 1, you have *Briggs*'s Logarithm of 2000, *viz.* 3.3010300.

If any Logarithm be given, ſuppoſe 3.3010300, throw away the Characteriſtic, then over againſt theſe Figures 3 ... 0 .. 1 ... 0 .. 3 .. 0 .. 0, you have in their reſpective Claſſes 1.995262315 ..., 0 ..... 1.002305238 ..... 0 ..... 1.000069080 ... 0 .. 0 which multiplied continually into one another, the Product is 2.000000019966, which by reaſon the Characteriſtic is 3, becomes 2000.000019966, *&c.* that is, 2000, the Natural Number deſired. I ſhall not mention the Method by which this Table is fram'd, becauſe you will eaſily ſee that from the uſe of it.

It is obvious to the intelligent Reader, that theſe Claſſes of Numbers are no other than ſo many Scales of mean Proportionals: In the firſt Claſs, between 1 and 10; ſo that the laſt Number thereof, *viz.* 1,258925412 is the tenth Root of 10, and the reſt in order aſcending are the Powers thereof. So in the ſecond Claſs, the laſt Number 1,023292992 is the hundredth Root of 10, and the reſt in the ſame manner are Powers thereof. So 1,002305238 in the third Claſs, is the tenth Root of the laſt of the ſecond, and the reſt its Powers, *&c.* Or, which is all one, each Number in the preceding Claſs, is the tenth Power of the correſponding Number in the next following Claſs: Whence 'tis plain, that to conſtruct theſe Tables requires no more than one Extraction of the fifth or ſurſolid Root for each Claſs, the reſt of the Work being done by the common Rules of Arithmetick; and for extracting the fifth Root, you will find more than one very compendious Rule in *Num.* 210 of theſe *Tranſactions*, if any one ſhall deſire to examin the *computus* of theſe Tables.

The Proceſs is exactly the Reverſe of Mr. *Briggs*'s Doctrine, in *Cap.* XII. of his *Arithmetica Logarithmica* of *Vlacq*'s Edition; and had *Briggs* been appriz'd hereof, it would have greatly eaſed the Labour of deducing the Logarithms of the firſt prime Numbers, which appear to have coſt him ſo much Pains.

II. *An*